

INTERVIEW SUMMARY

Applicants would like to thank Examiner Nguyen for the courtesies shown them in the personal interview held on February 27, 2007. In attendance for the Applicants was Aaron Haleva, Esq., an attorney of record. Applicants' attorney described the invention and the various processes claimed. The Examiner and Applicants' attorney discussed the cited Chen reference, and agreement was reached that the independent claims would be amended to include a default initiation of the local display mode.

REMARKS

This Amendment, in connection with the following remarks, are submitted as fully responsive to the Office Action. Claims 1, 22 and 26 have been amended. Claims 1, 22 and 26 are the independent claims. New claims 29-31 have been added. Favorable reconsideration is requested.

Claims 1-9, 11-18 and 20-26 stand rejected under 35 U.S.C. §102 as being anticipated by U.S. Patent No. 5,588,098 to Chen et al. ("Chen"). Claim 10 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Chen in view of U.S. Patent No. 6,826,297 to Sato ("Sato"). Claim 19 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Chen in view of U.S. Patent No. 5,422,987 to Yamada ("Yamada"). Claims 26-27 were indicated as being allowable if rewritten.

The method of claim 1, as amended, is directed to the interactive visualization of 3D models in a 3D data display. The method includes displaying data in a 3D data set in an overview mode where localization markers can be set, deleted, manipulated and viewed, and displaying data in a local mode where data in an interest region surrounding a localization

marker are rendered using different display parameters than those of the overview mode. The localization markers can be set, deleted and manipulated by a user at any point within the 3D data set, and the local display mode can be initiated by a user performing a defined action at the time of visualizing the data.

As described in the specification, when interacting with a 3D data set or model it is often useful or desired to pay attention to a particular smaller region within the model space, wherein one or more of the models displayed therein have significant features. *Specification at ¶ 6.* When interactively visualizing such smaller regions it is often desired to display them with different display properties than those utilized in the standard viewing mode, such as, for example, higher magnification, greater resolution, shading effects, etc. *Specification at ¶ 6.* In general these different display properties consume a greater amount of system resources and it is not effective to apply them to all points in the model space. *Id.*

To facilitate this desirable feature the present invention allows a user to interactively set, delete and manipulate one or more localization markers at any point in the model space. This allows a user to view a large model, such as, for example, of a colon or other anatomical region generally and look for points or regions of interest (“overview mode”). After a set of such points or regions of interest has been obtained, the user can return to each of them and analyze them in greater detail, using different, and generally more detailed, display parameters (“local mode”). *Specification at ¶ 27.* This is exactly how medical practitioners examine volumized medical scan data, such as, for example, a CT of a colon, a combined CT/MR of a brain, ultrasound of a liver, etc. First, a first pass is performed as a global or overall view and sites of interest are noted and recorded. Second, each site of interest is examined in detail, for tumors or other abnormalities requiring diagnosis or evaluation.

If a user was required to reset the local mode display parameters each time she moved to a new site of interest, this would not only be time consuming and tedious, but would tend to frustrate the user. Thus the present invention allows a user to store a set of sites of interest and associated sets of display parameters for each. When the user returns to a given site of interest, such as, for example, by placing her virtual tool or cursor within a defined distance from a localization marker, the region surrounding the localization marker automatically displays as she so desires.

Chen is directed to a method and apparatus for manipulating 3D objects on a computer display. Chen does not teach or suggest the method of amended claim 1. In Chen the objects to be manipulated are defined *a priori*. Moreover, each such predefined object has an associated fixed and also predefined bounding box. Throughout Chen the objects and their associated bounding boxes are never user defined or even modifiable. Each bounding box has a set of “sensitive areas” or “active zones” which can be selected and used to manipulate the object within the bounding box, as shown in Fig. 4. There is no teaching in Chen of a local display mode being initiated by a user action at the time of visualization.

Moreover, a user in Chen cannot designate one or more portions of an object as a new region of interest, and then associate new bounding boxes with them on the fly. For example, a user cannot designate just the seat of the chair in Fig. 3 as a new object that will be automatically displayed with different user defined parameters when a defined user action occurs, such as, for example, when the user places his cursor or virtual tool within a defined number of voxels of a localization marker placed by the user somewhere on that chair seat. This restriction is unacceptable in any medical imaging application, where *etiology* determines what is viewed in greater detail, not an *a priori* decision by the system or programmer as to (i) what the

size and expanse of a given *a priori* “object” is, and (ii) how that object can be displayed using pre-defined active zones at the edges of a pre-defined bounding box surrounding such fixed object. Claim 1 obviates such a cumbersome approach. Claim 1 recites that the user can set, delete, manipulate and view localization markers in an overview mode, and the user can then view a region surrounding such a localization marker by performing a defined action at the time of visualization, such as, for example, bringing a cursor or virtual tool within a certain distance of the localization marker (*see* dependent claim 29).

For at least these reasons, claim 1 is respectfully asserted as patentable over Chen. For similar reasons independent claims 22 and 26, which recite similar features, are also urged as patentable over Chen.

Neither Sato nor Yamada is seen by Applicants as curing the defects of Chen as a reference against the independent claims, whether taken alone or in combination. Thus, dependent claims 2-21, 23-25 and 27-31 are also urged as patentable over Chen, Sato and Yamada, whether alone or in any combination.

Addressing any concerns of the Examiner under 35 U.S.C. 101 as articulated in the Examiner’s Interview Summary, Applicants would like to point out that claims 22 and 26 are fully supported in the Specification at least by the disclosure on page 20, line 13 through page 24, line 32. In particular, the disclosure at page 20, lines 13-25 describes how an exemplary computer program can be stored, for example, on a hard drive, flash memory, etc., and then can be, for example, accessed by the CPU of an appropriate data processor. The *Specification* continues thereafter with the detailed description of such an exemplary process.

If any questions remain as to the patentability of the pending claims, Applicants respectfully request the opportunity to have an interview with the Examiner, review same, and present their point of view. The Examiner is thus invited to notify Applicants' undersigned attorney if such questions remain so that an interview can be scheduled.

No additional fees are believed due herewith. If any additional fees are due, the Commissioner is hereby authorized to charge any fee deemed necessary for the entry of this Amendment to Deposit Account No. 50-0540.

Dated: April 16, 2007

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Aaron S. Haleva', is written over a horizontal line.

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